MATHEMATICS & COMPUTER SCIENCE COURSE DESCRIPTIONS

Algebra I

Prerequisites: Completion of Common Core State Standards Math Grade 8
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 9 - 12. Algebra I is a first-year algebra course that expands on the rules of arithmetic learned in pre-algebra. Topics include: identifying the number systems; simplifying expressions using algebraic symbols, formulas, arithmetic operations, and properties of exponents; solving, writing, and graphing linear equations and inequalities; solving systems of linear equations; simplifying, rationalizing, and solving problems containing radicals; introducing function notation and exponential functions, solving and graphing quadratic equations. A TI-Nspire CX CAS calculator will be required for this course as a teaching aid to visualize algebraic concepts. When necessary, students will have the option to enroll in an additional 50 minutes of math support through Algebra I Lab.

Algebra I Lab

Prerequisites: Concurrent enrollment in Algebra I and department placement
Credits earned: 0
Meets graduation requirement: No

Open to grades 9 - 12. Algebra I Lab is a small group support class offered to students who are enrolled in Algebra I. Placement in this class is intentional, and at the start of the school year, is based on students' grades in their 8th grade math course and their MAP/STAR scores. The goal of this course is to help students develop a growth mindset in mathematics by providing targeted content support. Students will work to fill content gaps as well as develop their problem solving and critical thinking skills. Students will attend Lab twice a week, for a total of 50 additional minutes of targeted algebra support.

Algebra I Enrichment

Prerequisites: Completion of Common Core State Standards Math Grade 8 and department chair approval
Credits earned: 1 (Elective Math Credit)
Meets graduation requirement: No

Open to grade 9. Algebra I Enrichment is a one semester course, only offered in the first semester. This course is intended for students who did not have a full year of Algebra I in 8th grade, and whose MAP score data and grades in their 8th grade math class support acceleration. Algebra I Enrichment will cover topics typically covered in the second semester of Algebra I. It should be taken concurrently with Geometry.

Geometry

Prerequisites: Completion of Algebra I
Credits earned: 2

Meets graduation requirement: Yes

Open to grades 9 - 12. This course is an introduction to the basic principles of Euclidean geometry. Students have the opportunity to learn key definitions, symbols, notations, theorems, and properties of geometric figures that serve as the foundation of the course. Emphasis is placed on developing deductive reasoning and logical thinking skills through the use of geometric proof. Content explored includes: basic definitions, lines, angles, triangles, quadrilaterals, circles, polygons, solids, congruence, similarity, proportion, elementary trigonometry, and formulas for perimeter, area, surface area and volume. The curriculum will be presented utilizing a wide variety of instructional strategies, which could include cooperative learning, mathematical discourse, discovery learning, projects, math labs, and technology. Students are expected to complete daily homework assignments which may include projects and labs. A TI-Nspire CX CAS calculator will be required for this course as a teaching aid to visualize concepts. When necessary, students will have the option to enroll in additional math support through Geometry Lab.

Geometry Lab
Prerequisites: Concurrent enrollment in Geometry and department placement
Credits earned: 0
Meets graduation requirement: No

Open to grades 9 - 12. Geometry Lab is a small group support class offered to students who are enrolled in Geometry. Placement in this class is intentional, and at the start of the school year, is based on students' grades in their Algebra I course and their MAP/STAR scores. The goal of this course is to help students develop a growth mindset in mathematics by providing targeted content support. Students will work to fill content gaps as well as develop their problem solving and critical thinking skills.

Geometry Honors
Prerequisites: Completion and demonstrated proficiency in Algebra I (based on grades & MAP scores)
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 9 - 12. In this course, students study the properties of geometric figures including area and volume of two and three-dimensional figures. Emphasis is placed on the Pythagorean Relationship. Students investigate deductive reasoning and critical thinking processes through the study of formal proofs. Algebra and geometry are studied as analytical geometry (combining equations and graphs) to solve problems in the coordinate plane. The curriculum will be presented utilizing a wide variety of instructional strategies, which could include cooperative learning, mathematical discourse, discovery learning, projects, math labs, and technology. Students are expected to complete daily homework assignments which may include projects and labs. A TI-Nspire CX CAS calculator will be required for this course as a teaching aid to visualize concepts.

Algebra II
Prerequisites: Completion of Geometry

Credits earned: 2
Meets graduation requirement: Yes

Open to grades 10 - 12. This course covers topics typical for a second year algebra course. This course is intended to prepare students for Precalculus or Pathway to Quantitative Literacy & Statistics. Topics in this course include, but are not limited to, solving and graphing linear, quadratic, and polynomial equations and inequalities, solving systems in two and three variables, properties of exponents, as well as solving and graphing rational and radical equations. There will be an emphasis on understanding multiple representations for each function and improving mathematical reasoning skills. A graphing calculator is required for this course.

Algebra II Advanced (Formerly titled "Algebra II with Trigonometry")
Prerequisites: Completion of Geometry and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 9 - 12. This course covers topics typical for a second-year algebra course, including trigonometry. This course is intended to prepare students for Precalculus Advanced or Precalculus. There will be daily homework assignments and occasional projects and labs. Semester one topics in this course include solving and graphing linear, quadratic, and polynomial equations and inequalities, solving systems in two and three variables. Second semester covers properties of exponents, solving and graphing rational, logarithmic, exponential and radical equations. The course concludes with topics of trigonometry including right triangles, introductory graphing and solving basic trigonometric equations. A TI-Nspire CX CAS calculator will be required for this course as a teaching aid to visualize algebraic concepts.

Algebra II Honors (Formerly titled "Algebra II with Trigonometry Honors")
Prerequisites: Completion of Geometry Honors and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 9 - 12. This course covers topics typical for a second year algebra course, including trigonometry. This fast-paced course is intended to prepare students for Precalculus Honors. There will be daily homework assignments and occasional projects and labs. In this course students will study the classes of functions such as linear, quadratic, exponential, logarithmic, rational, polynomial, and trigonometric.   There is a strong emphasis on discovery-based learning where the use of technology will lead students to a deeper understanding of these classes of functions. A significant amount of time is devoted to the derivation, and proof of many trigonometric properties. A TI-Nspire CX CAS calculator will be required for this course as a teaching aid to visualize algebraic concepts.

Precalculus
Prerequisites: Completion of Algebra II or Algebra II Advanced (formerly titled "Algebra II with Trigonometry") and teacher recommendation or department approval
Credits earned: 2

Meets graduation requirement: Yes

Open to grades 10 - 12. This Common Core-aligned course offers students a bridge from high school to college mathematics. It is appropriate for students planning on taking a college-level calculus course in the future. Students have the opportunity to revisit previously learned topics using an application-based approach, while developing problem solving and critical thinking skills, and extending their knowledge into unexplored curricula. Students will learn content such as higher-order polynomial functions, trigonometry, inequalities, logarithms and sequences and series. Curriculum is presented in utilizing a variety of instructional strategies including interactive lecture, cooperative learning, mathematical discourse, discovery learning, and the use of technology primarily through a graphing calculator and Vernier probes. There is an expectation of daily homework, including reading the text and applying the concepts presented in the text towards solving problems.

AP Precalculus
Prerequisites: Successful completion of Algebra II Advanced (formerly "Algebra II with Trigonometry) or Algebra II Honors (formerly "Algebra II with Trigonometry Honors"), teacher recommendation, or department approval
Credits earned: 2
Meets graduation requirement: Yes

AP Precalculus AB is open to grades 10 - 12 and is a full year course designed to be the equivalent of a first semester college precalculus course. This course provides students with an understanding of the concepts of college algebra, trigonometry, and additional topics that prepare students for further college-level mathematics courses. AP Precalculus AB prepares students for the College Board AP Precalculus Exam. This course extends students' understanding of polynomial, rational, exponential, logarithmic, trigonometric, and polar functions. Throughout the course, the mathematical practices of procedural and symbolic fluency, multiple representations, and communication and reasoning are developed. Students experience the concepts and skills related to each function type through the lens of modeling, and engage each function type through their graphical, numerical, analytical, and verbal representations. For sophomore and junior students, successful completion of this course will prepare students to take AP Calculus AB in the following school year. For senior students, successful completion of this course will prepare students to take calculus or another at-level math course upon entering college.

AP Precalculus BC is open to grades 10 - 12 and is a full year course designed to be the equivalent of a first semester college precalculus course. This course provides students with an understanding of the concepts of college algebra, trigonometry, and additional topics that prepare students for further college-level mathematics courses. AP Precalculus AB prepares students for the College Board AP Precalculus Exam. This course covers all the content of AP Precalculus AB in greater depth, and in addition, students will be introduced to sequences and series, and functions involving parameters, vectors, and matrices. For sophomore and junior students, successful completion of this course will prepare students to take AP Calculus BC in the following school year. For senior students, successful completion of this course will prepare students to take calculus or another at-level math course upon entering college.

Pathway to Quantitative Literacy & Statistics

Prerequisites: Completion of Algebra II and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grade 12. The framework of this course is designed to prepare and transition students directly into college and career pathways requiring general education college level math competencies in quantitative literacy and statistics. The competencies within each domain should include but are not limited to: numeracy (operation sense, estimation, measurement, quantitative reasoning, basic statistics, and mathematical summaries), application based algebraic topics, and functions and modeling. Upon completion students should be able to: demonstrate proficiency and understanding in basic numeracy competencies in whole numbers, integers, fractions, and decimals, use estimation and explain/justify estimates, apply quantitative reasoning to solve problems involving quantities or rates, use mathematical summaries of data such as mean, median, and mode, use and apply algebraic reasoning as one of multiple problem-solving tools, and use functions and modeling processes. This course is to be delivered through authentic application, problem-based instruction designed to build mathematical conceptual understanding and critical thinking skills. This course does not meet NCAA requirements. However, students who have successfully completed Algebra I, Geometry, and Algebra II, **and** who have earned a 70% or higher in both semesters of this Pathways class, can earn a portability code on their transcript that will automatically place them in a credit-bearing math course at a community college (eliminating the need for a math placement test).

Calculus

Prerequisites: Completion of Precalculus and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 11 & 12. This course is designed for students wishing to continue their preparation for calculus. This is not an AP course, and therefore provides the teacher the flexibility to determine pace and content to best meet the students' needs. Students will study various topics including functions and their graphs, mathematical modeling, polynomial and rational functions, limits and their properties, applications of differentiation, exponential and trigonometric functions with calculus, and an introduction to integration. A graphing calculator will be required. The curriculum is presented utilizing a wide variety of instructional strategies including interactive lecture, cooperative learning, discovery learning and use of technology.

AP Calculus AB

Prerequisites: Completion of Precalculus and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 11 & 12. This course is equivalent to one semester of college calculus. The curriculum includes the study of differential and integral calculus. Topics are presented algebraically, numerically, graphically, and verbally, aligning with the College Board's recommendations in order to prepare students for the AP Calculus AB exam in May and a second

semester of college calculus. The curriculum is presented conceptually, utilizing a wide variety of instructional strategies including, but not limited to direct instruction, cooperative learning, discovery learning, and use of technology. There is an expectation of daily homework, including pre-reading the text. A TI-Nspire CX CAS calculator is required.

AP Calculus BC
Prerequisites: Completion of Precalculus Honors and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 11 & 12. This course is equivalent to two semesters of college calculus. Students will learn topics using an application-based approach while extending mathematical knowledge into new concepts. Content explored includes the study of sequences and series in addition to the study of differential and integral calculus. Topics are presented algebraically, numerically, graphically, and verbally, aligning with the College Board's recommendations. The curriculum is presented utilizing a wide variety of instructional strategies, including interactive lecture, cooperative learning, discovery learning, and use of technology. There is an expectation of daily homework, including pre- reading the text. A TI-Nspire CX CAS calculator is required.

Multivariable Calculus Honors
Prerequisites: Completion of AP Calculus BC and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 11 & 12. This course is an advanced course in mathematics which covers topics from third semester college calculus. Students expand their study of vector and parametric functions. Students use technology to explore plots of three-dimensional surfaces and paths. Course includes the study of partial derivatives, double and triple integrals, line integrals and surface integrals. Students are expected to learn independently through reading the text and resources found on the internet. Students must be able to grasp abstract mathematical concepts, as well as follow and make valid mathematical arguments. Classroom structures include computer lab work, lecture, student presentations, and cooperative group investigations. A graphing calculator is required.

AP Statistics
Prerequisites: Completion of Algebra II and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 10 - 12. This course teaches students how to apply their knowledge of data analysis, planning a study, probability and simulation, and statistical inference to make decisions, make sense of the world and solve problems in the world. This course places a strong emphasis on conceptual understanding and application to real-world situations, and students will be able to apply this knowledge to a broad range of topics. Additionally, students will collaborate with

classmates to investigate questions that interest them through projects. Students will be given opportunities to make extensive use of technology, such as simulation applets and graphing calculators. Students should expect to have daily homework assignments. A TI-Nspire CX CAS calculator is required.

Computer Science Topics *(Formerly titled "Intro to Computer Science")*
Prerequisites: None
Credits earned: 2
Meets graduation requirement: No; Meets Computer Literacy requirement: Yes

Open to grades 9 - 12. This course is a year-long introduction to the basic science and artistry of structured programming and computer science. It is designed to be appropriate for students with little to no computing background and will introduce students to various computer science topics that include data science, cyber security, graphics/web design, programming and logic, game design and programming mobile applications. HTML, CSS, Photoshop, MIT AppInventor and Python are the primary languages/software tools used in the development and mastery of course targets. Because it is a lab-based course, students will spend a considerable amount of time experimenting with course topics. Each unit will be an introduction to a topic and will last about four to six weeks. Each semester will end with a culminating, student-driven project using the skills they have previously learned to solve a problem of their own choosing.

AP Computer Science Principles
Prerequisites: Successful completion of Algebra I
Credits earned: 2
Meets graduation requirement: Yes; Meets Computer Literacy requirement: Yes

Open to grades 10 - 12. AP Computer Science Principles is an introductory college-level computing course that introduces students to the breadth of the field of computer science, and its potential for transforming the world we live in. Students learn to design and evaluate solutions and to apply computer science to solve problems through the development of algorithms and programs. They incorporate abstraction into programs and use data to discover new knowledge. Students also explain how computing innovations and computing systems—including the internet—work, explore their potential impacts, and contribute to a computing culture that is collaborative and ethical. Student discovery, collaboration, and creativity are central to the delivery of course curriculum. Per the AP College Board, this course culminates with a comprehensive exam and a portfolio submission. The portfolio submission (coding applications) is completely student driven, therefore, the ability to work independently, problem solve and persevere are essential. Students will need no programming experience to be successful in this course, although those who have done work in programming previously will find significant benefit in taking this course.

AP Computer Science A
Prerequisites:
- Successful completion of AP Computer Science Principles **OR**
- No Computer Science experience, but concurrent enrollment in Precalculus Honors required **OR**

- Successful completion of Computer Science Topics (formerly Intro to CS) and CS teacher approval

Credits earned: 2
Meets graduation requirement: Yes; Meets Computer Literacy requirement: Yes

Open to grades 10 - 12. AP Computer Science A is a dynamic course designed to provide motivated students the opportunity to experience firsthand the enjoyment, challenge, and artistry of computer science through programming.   Fundamental topics in this course include the design of solutions to problems, the use of data structures to organize large sets of data, the development and implementation of algorithms to process data and discover new information, the analysis of potential solutions, and the ethical and social implications of computing systems. The course emphasizes object-oriented programming and design using the Java programming language. Students who invest the necessary level of effort and time should expect to enjoy a significantly increased ability to solve complex and abstract problems in both programming and non-programming contexts. This is a course that demands students be both independent and team workers. What is done from day to day in class will vary depending on the individual needs and ability levels of each student. Thus, both independence and teamwork are prerequisites for students wishing to do well in this course, and on the accompanying AP test.

Trigonometry & Related Topics - *THIS COURSE IS NOT INTENDED TO RUN IN 2024-2025*
Prerequisites: Completion of Algebra 2 and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 11 & 12. This course develops the concepts of trigonometry including unit circle trigonometry, graphing of trigonometric functions, solving triangles, and verifying trigonometric identities. There is an introduction to precalculus topics including conic sections, sequences and series, exponential and logarithmic functions, statistics and data analysis. The curriculum will be presented utilizing cooperative learning, discovery learning and technology. Teachers expect students to have a graphing calculator and complete daily homework. Students demonstrate learning through assignments, group/partner work, tests, quizzes, lab activities and projects.

Precalculus Advanced - *THIS COURSE IS NOT INTENDED TO RUN IN 2024-2025*
Prerequisites: Completion of Algebra 2 with Trigonometry and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 10 - 12. This Common Core-aligned course offers students a bridge from high school to college mathematics, with a focus on STEM. It is intended for students planning on taking a college-level calculus course in the future. Students have the opportunity to revisit previously learned topics using an application-based approach, also extending their knowledge into unexplored curricula. Students explore content such as higher-order polynomial functions,

trigonometry, inequalities, logarithms, polar functions, parametric functions, vectors and sequences and series, as well as an introduction to calculus. Curriculum is presented in utilizing a variety of instructional strategies including interactive lecture, cooperative learning, mathematical discourse, discovery learning, and the use of technology primarily through a graphing calculator and Vernier probes. There is an expectation of daily homework, including reading the text and applying the concepts presented in the text towards solving problems.

Precalculus Honors - *THIS COURSE IS NOT INTENDED TO RUN IN 2024-2025*
Prerequisites: Completion of Algebra 2 with Trigonometry Honors and teacher recommendation or department approval
Credits earned: 2
Meets graduation requirement: Yes

Open to grades 10 - 12. This course's intent is to provide a thorough preparation for the study of college Calculus. Students have the opportunity to revisit previously learned topics using an application-based approach, all while extending mathematical knowledge into new concepts. Content explored includes: higher order polynomial functions, additional circular trigonometry, inequalities, logarithms, exponential functions, basic probability and statistics, polar equations and graphs, vectors, series and sequences, as well as an introduction to the fundamental concepts of calculus including limits, derivatives, and integrals. The curriculum will be presented utilizing a wide variety of instructional strategies, including cooperative learning, mathematical discourse, discovery learning, and technology. There is an expectation of daily homework, including reading the text. A TI-Nspire CX CAS calculator is required.